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CALABAZAS CREEK
Planning Study

consisting of
the

Final Engineer's Report

March 1978

Santa Clara Valley Water District

PROPERTY OF SANTA CLARA VALLEY
WATER DISTRICT
5750 Almaden Expressway
San Jose, California 95118

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SANTA CLARA VALLEY WATER DISTRICT

CALABAZAS CREEK

Lawrence Expressway to El Camino Real

Planning Study
consisting of the

FINAL ENGINEER'S REPORT

Project Number 2010

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March 1978

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TELEPHONE (408) 265-2600

March 7, 1978

Honorable Board of Directors
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

Dear Board Members:

This is a Final Engineer's report on Proposed Flood Control Measures for Calabazas Creek between Lawrence Expressway and El Camino Real, Project No. 2010. This project is within the city limits of Santa Clara in the North Central Zone of the Santa Clara Valley Water District.

The report identifies and assesses the flooding potential along Calabazas Creek. It also presents and evaluates the alternative solutions to the flooding problem and recommends a specific solution for implementation.

The recommended project is the enlargement of culverts under Lawrence Expressway, Benton Street, and Pomeroy Avenue. Also proposed is the modification of all inlet and outlet transitions at the street crossings. The existing concrete-lined channel between the street crossings and the culvert under El Camino Real are adequate to convey the 1 percent flood.

The estimated cost of the recommended project is $747,900. The project can be financed from the ad valorem tax in the North Central Flood Control Zone of the District.

An environmental assessment of the proposed project has determined that there are no substantial adverse impacts. Therefore a Negative Declaration is recommended.

I concur in the project as proposed and recommend that a public hearing be held as a prerequisite to the preparation of the final plans and specifications for construction.

Sincerely yours,

John T O'Halloran
John T. O'Halloran
General Manager

Attachment

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SUMMARY

A study on the Calabazas Creek channel between Lawrence Expressway and El Camino Real in the City of Santa Clara shows that the culverts at Lawrence Expressway, Benton Street and Pomeroy Avenue are inadequate to pass the 1 percent flood.[1] Based on today's conditions, however, the 1 percent flood will not reach the channel between Lawrence Expressway and El Camino Real. This is because the channel upstream of Lawrence Expressway is too small. Water will break out and cause flooding upstream. Some flooding will occur in the lower reach also. The problem of the upstream flooding will be discussed in a separate report since the channel upstream of Lawrence Expressway requires extensive study before the flooding problem can be solved.

The study covered in this report extends between Lawrence Expressway and El Camino Real. Except for the inadequate culverts mentioned above, the entire concrete-lined channel between Lawrence Expressway and El Camino Real is adequate for the 1 percent flood. The culvert at El Camino Real is also adequate. The present flooding potential is in the reach between Pomeroy Avenue and El Camino Real. It is caused by the undersized culvert at Pomeroy Avenue. This culvert has the smallest capacity compared to the flow capacities of the upstream channel and the culverts at Lawrence Expressway and Benton Street. Water will rise above this culvert and flow

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[1] See Page 12 for discussion on the 1 percent flood.

across the street, thus inundating the areas adjacent to the channel.

Even though the culverts at Lawrence Expressway and Benton Street are adequate to pass the water that could get to these crossings today, they will not be adequate when the channel upstream of Lawrence Expressway is made large enough to carry the 1 percent flood. The culverts at Lawrence Expressway and Benton Street need to be enlarged to the 1 percent flow capacity. It is proposed that this work be done prior to enlarging the capacity of the upstream channel. The completed project will provide flood protection to the area between Pomeroy Avenue and El Camino Real. It will also avoid future flooding when the channel upstream of Lawrence Expressway is made adequate for the 1 percent flood.

Two alternatives have been studied to improve the flow capacities of these inadequate culverts. They are:

Alternative 1 - Enlarge street culverts by constructing additional box culvert cells under Lawrence Expressway, Benton Street, and Pomeroy Avenue.

Alternative 2 - Replace box culverts under Benton Street and Pomeroy Avenue with clear-span bridges and construct additional box culvert cells under Lawrence Expressway.

Alternative 1 is the recommended project. The estimated cost for the project is $747,900. The project can be financed from the ad valorem tax in the North Central Zone of the Santa Clara Valley Water District.

INTRODUCTION

This report presents a discussion on a proposed flood control project for Calabazas Creek between Lawrence Expressway and El Camino Real, in the City of Santa Clara, California. Figure 1 shows a general area map of Calabazas Creek. The report also recommends a specific alternative for construction.

Purpose of the Project

Ultimately, the proposed project in conjunction with several other flood control projects along Calabazas Creek will eliminate the potential flooding and erosion problems along the entire creek, for at least the 1 percent flood. The project, as proposed here, will have the immediate flood control benefits of protecting the area between Pomeroy Avenue and El Camino Real from flooding. It will also make the study reach (Lawrence Expressway to El Camino Real) adequate for the 1 percent flood.

Scope of the Project

This report describes, in detail, Calabazas Creek, its location, watershed, channel capacity, and historic flooding. Also described in the report are the design flood, alternative solutions, costs for alternative solutions, and the recommended project. The recommended project between Lawrence Expressway and El Camino Real and its elements, costs and financing are fully described. This report, however, does not describe other projects on Calabazas Creek which may be planned for future implementation.

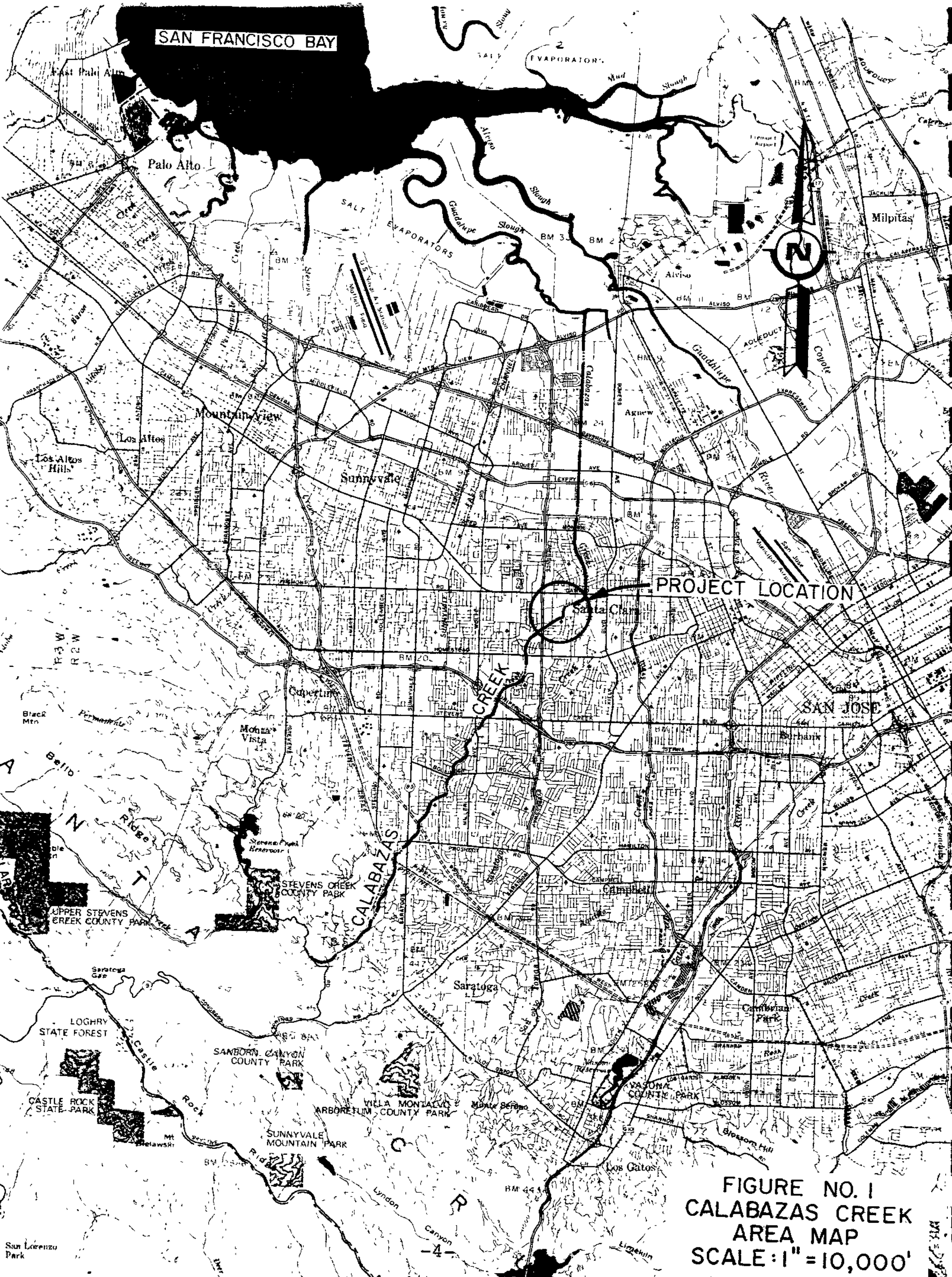

FIGURE NO. 1
CALABAZAS CREEK
AREA MAP
SCALE: 1" = 10,000'

Previous Reports

The portion of Calabazas Creek discussed in this report (Lawrence Expressway to El Camino Real) was included in the January 1961 report titled "Engineer's Report of Proposed Improvements for Zone NC-1, the North Central Zone", prepared by the Santa Clara County Flood Control and Water Conservation District, a forerunner agency of the present Water District. The purpose of that report was to discuss construction of twelve flood and erosion control projects in the North Central Zone for which a bond election was held. The report discussed all aspects of flooding and erosion problems. Erosion control, however, was of major concern.

The recommended project in the reach between Lawrence Expressway and El Camino Real of Calabazas Creek was to construct a number of drop structures and to enlarge street culverts under Lawrence Expressway, Benton Street, and Pomeroy Avenue. The drop structures would control channel slope and flow velocity thereby reducing channel erosion. The enlarged box culverts would provide the desired flow capacities.

Construction began in 1962. Three concrete drop structures were constructed; one at Lawrence Expressway, one at Benton Street, and one at Pomeroy Avenue. The culvert at Pomeroy Avenue was replaced with a larger box culvert (12-foot-wide by 10-foot-high). The culverts at Lawrence Expressway and Benton Street were replaced with a double 8-foot-wide by 8-foot-high and a double 8-1/2-foot-wide by 8-foot-high box culvert respectively. The completed project provided protection against flooding. But, due to poor soil conditions and steep channel banks, the earth channel continued to erode. In 1966, the City of Santa Clara, as part of its Calabazas Boulevard Improvement Project, concrete-lined the reach between Pomeroy Avenue and El Camino Real and removed the drop structure at Pomeroy Avenue. The work was done through an agreement with the Santa Clara County Flood Control and Water District, also a forerunner agency of the present Water District. The concrete-lining protected the channel from eroding further, but the earth channel upstream of Pomeroy Avenue continued to erode and suffered extensive damage during the high flows of 1968, 1969, and 1970. Furthermore, a reevaluation of the District's hydrology methodology (based on the latest hydrologic technique and a longer historic streamflow record) revealed that the expected flows from the 1 percent flood were considerably greater than those estimated from the earlier hydrology studies. In 1971, the Santa Clara County Flood Control and Water District concrete-lined the reach from Lawrence Expressway to Pomeroy Avenue based on the new hydrology methodology.

The existing channel is a concrete-lined trapezoidal channel. It has a base width of 12 feet and the side slopes of one horizontal to one vertical (1:1). The depth of the concrete channel varies between 9 feet and 12 feet. The channel is adequate for the new design flows. The culverts under Lawrence Expressway, Benton Street, and Pomeroy Avenue are inadequate and will be discussed later in this report.

Several reports have dealt with the feasibility of damsites within the Calabazas Creek watershed. They are:

- A "Report to the Santa Clara Valley Water Conservation Committee on the Santa Clara Conservation Project" by Tibbetts and Kieffer, March 1921.
- A "Revised 1956 Wastewater Salvage Report" by the Santa Clara Valley Water Conservation District.
- The "December 1975 Master Plan for the Expansion of the In-County Water Distribution System" by the Santa Clara Valley Water District.

Although these reports discussed damsites primarily from the water supply and conservation viewpoints, it was recognized that flood reduction might also be achieved. For various reasons, however, a dam on Calabazas Creek was never built. The likelihood of ever having a dam on Calabazas Creek has steadily declined, since, in recent years, many expensive homes have been built on the potential reservoir sites.

Ongoing Studies and Construction on Other Portions of Calabazas Creek

The District staff has recently completed studies or is in the process of studying all of Calabazas Creek from Guadalupe Slough, near San Francisco Bay, to the foothills of the Santa Cruz Mountains. Under study are the reaches from Guadalupe Slough to Bayshore Freeway (U. S. 101) and Lawrence Expressway to the Headwaters. Construction is either underway or completed on the reaches between U. S. 101 and El Camino Real and between Interstate 280 and Stevens Creek Boulevard.

DESCRIPTION OF THE PROBLEM

This section of the report discusses the project location, watershed and creek channel, historic flooding, design flood, and the capacity of the culverts.

Project Location

The proposed project is at three locations in the City of Santa Clara. They are Lawrence Expressway, Benton Street, and Pomeroy Avenue. The study limits covered in this report are about 5070 feet long and extend from southwest of Lawrence Expressway to north of El Camino Real. Figure 2 shows the limits of the study.

Description of Watershed and Creek Channel

Calabazas Creek originates in the foothills of the Santa Cruz Mountains. It flows generally in the northerly direction through the Cities of Saratoga, San Jose, Cupertino, Santa Clara and Sunnyvale and discharges into Guadalupe Slough. The entire creek watershed is within Santa Clara County. The watershed is bounded on the west by the Stevens Creek watershed and on the east by the Saratoga Creek watershed. The creek covers a drainage area of about 17 square miles above El Camino Real. About one-fifth of this drainage area is hilly terrain and the rest is on the relatively flat valley floor. The elevation of the watershed varies between 2000 feet m.s.l. (mean seal level) near the mountain tops and 85 feet m.s.l. near the valley floor.

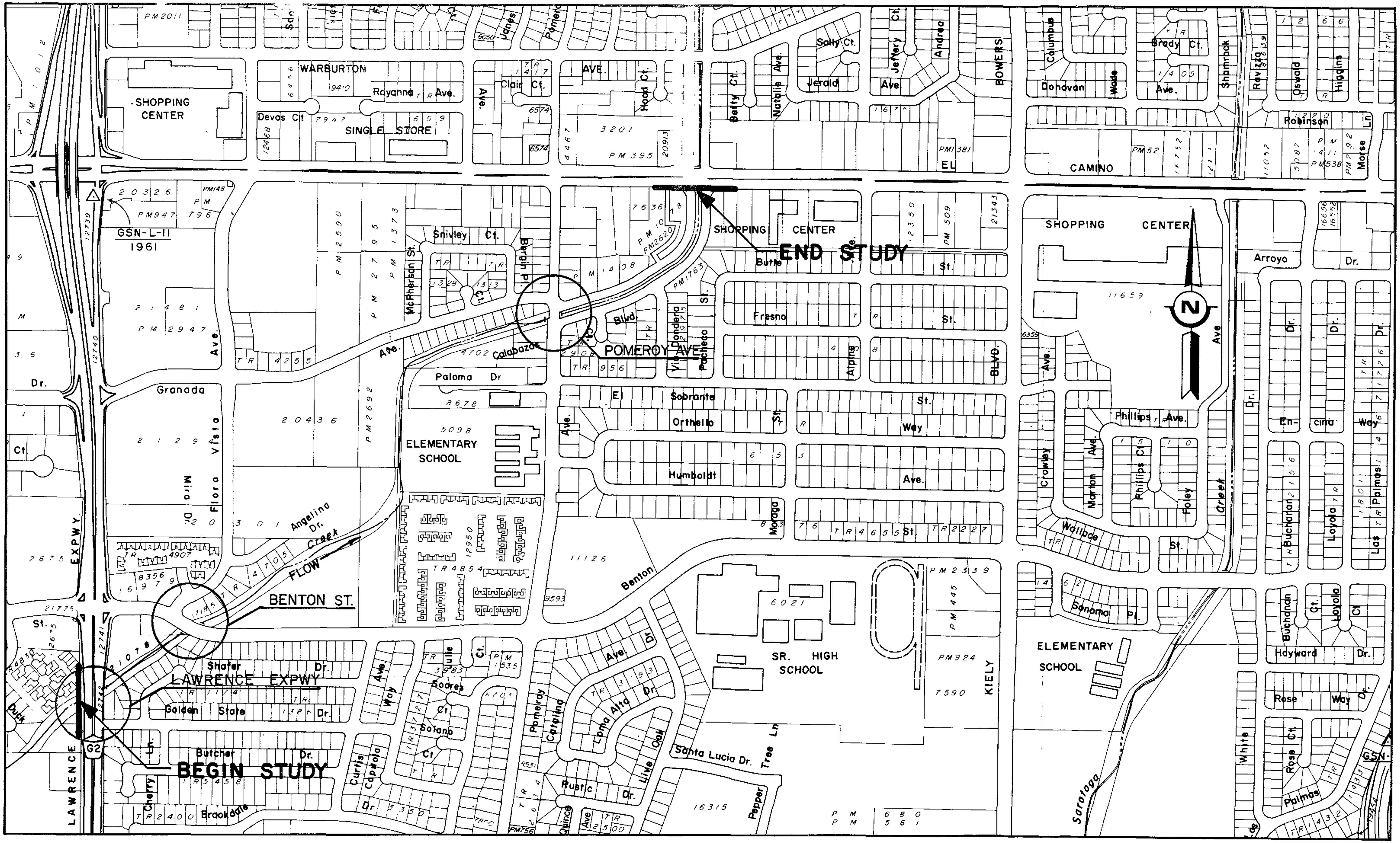

FIGURE 2
CALABAZAS CREEK
PROJECT SITE MAP
SCALE: 1" = 500'

The hilly areas are characteristically brushy woodlands consisting of Oak (White and Live), Buckeye and Bay Trees. Compared to the valley floor, little development exists in the upland areas. It is unlikely that much development will occur in the future because of the area's topography and the potential geologic hazards. The gently sloping valley floor, on the other hand, is developed extensively. Open fields and orchards have been transformed into residential subdivisions, shopping centers, and commercial buildings. Figure 3 shows a map of Calabazas Creek watershed and illustrates the general topography of the area.

The area has a generally mild climate. Temperatures range from an average high of about 81°F during July to an average low of about 49°F in January. The hilly lands have a mean annual precipitation of about 37 inches and the valley floor about 16 inches. Almost 90 percent of the rainfall takes place in the five winter months, November through March. The steep nature of the upper tributary creek watershed results in short duration, high intensity runoff for most major storms. After each major runoff, low-flow continues in the channel for several weeks as water temporarily stored in the natural storages of the watershed seeps into the channel. The channel is usually dry in the summer months thereby eliminating fish life; however, it supports various animal life that can find water elsewhere during the dry months.

Although the reach from Lawrence Expressway to El Camino Real has no percolation value due to its concrete lining and imperviousness, the District uses the reaches upstream of

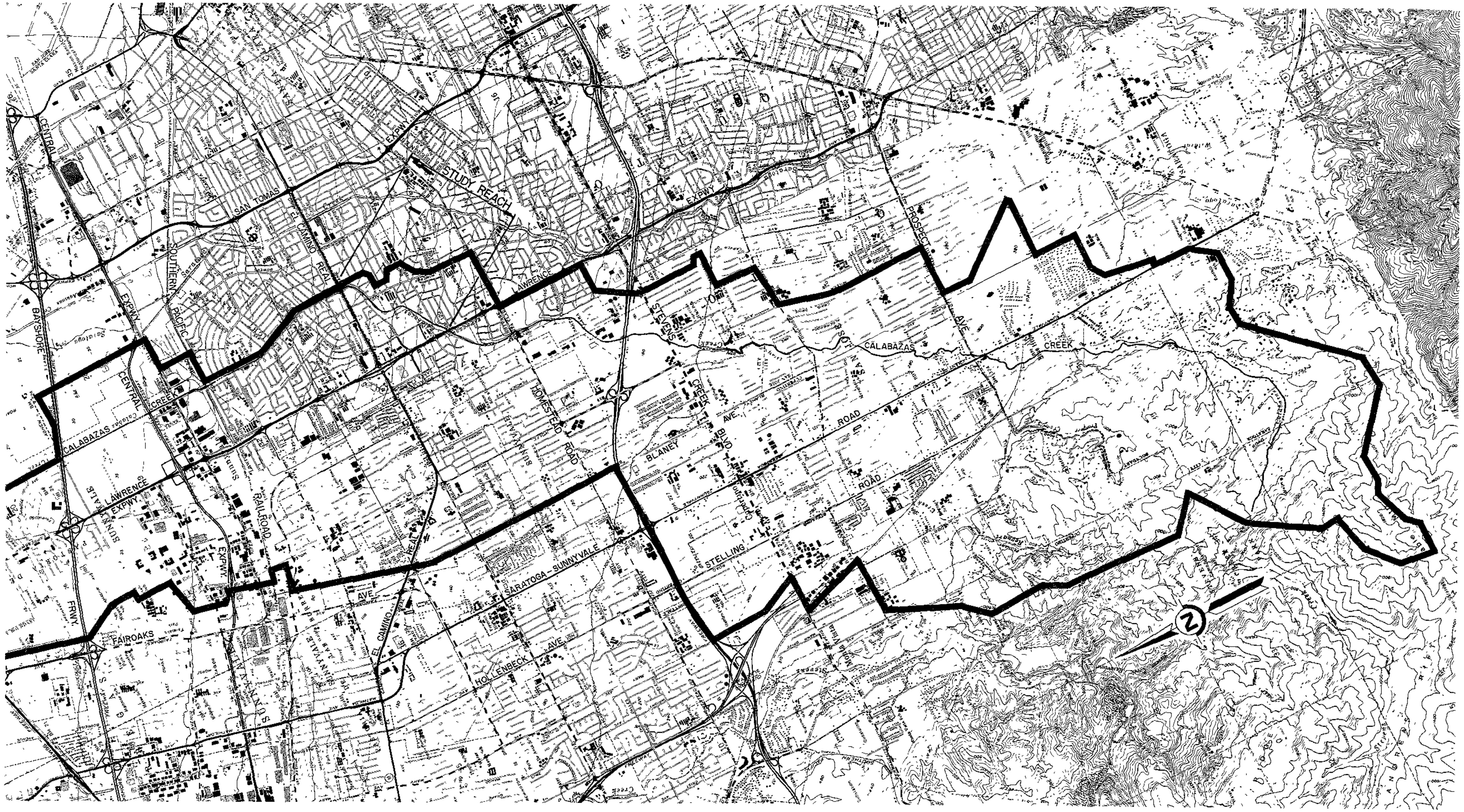

FIGURE 3

CALABAZAS CREEK WATERSHED

SCALE: 1" = 2000'

Lawrence Expressway as a natural groundwater recharge facility. When water is available, in non-drought years, flows from the Stevens Creek Pipeline (just south of Prospect Road in Saratoga) are released in these upstream reaches for percolation into the groundwater basin. It is estimated that between 1/2 and 1 acre-foot per day percolates into the groundwater basin.

Historic Flooding

Calabazas Creek has a history of flooding. During the floods of December 1955 and April 1958, extensive damage occurred to the residential and commercial properties in the Cities of Saratoga, Santa Clara and Sunnyvale. It was reported that in Sunnyvale alone, about 166 homes were inundated up to a depth of 3 feet during the 1955 flood.[1] The cost of the damage was estimated at $300,000, which today would be a considerably higher amount.

The flow from the 1955 flood was recorded at 2470 c.f.s. (cubic feet per second). This is about 82 percent of the present design flow. Table 1 lists the 10 highest recorded flood flows during the last 32 years on Calabazas Creek.

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[1] "Report on Floods of December 1955 and January 1956 in Northern California Coastal Streams," San Francisco District, U. S. Corps of Engineers, June 1956, page 90.

TABLE 1

LARGEST FLOOD FLOWS ON CALABAZAS CREEK 1946-1977

No.	Flow Rate in Cubic Feet per Second	Date
1	2470 cfs	12/22/55
2	2000 cfs	04/02/58
3	1800 cfs	01/31/63
4	1600 cfs	01/30/68
5	1490 cfs	01/26/69
6	1350 cfs	02/16/59
7	1220 cfs	02/01/75
8	1200 cfs	01/21/64
	1200 cfs	01/24/67
9	1005 cfs	11/28/70
10	1000 cfs	01/11/52

Source - Santa Clara Valley Water District Gauging Station 26A

Design Flood

The proposed project has been designed to convey the "1 percent flood". The "1 percent flood" is the largest flood flow which could be expected to be equaled or exceeded on an average of once in one hundred years over a long period of time. It is the flood flow which has a 1 percent chance of being equaled or exceeded in any one year. It cannot be overemphasized that flows much higher than the 1 percent flood could occur sometime in the future. Thousands of acres of developed land in the United States have been severely damaged by floods that were larger than the 1 percent floods. Despite this fact, there is a reasonable limit to the level of flood protection that should be provided to an urbanized area. Throughout the United States this reasonable level is generally recognized to be the 1 percent flood. This is the level used by most federal agencies, including the U. S. Department of Housing and Urban Development (HUD), for their flood insurance programs. The policy of the Water District is to provide flood protection for the 1 percent flood for streams having watersheds larger than four square miles. Calabazas Creek falls in this category. The 1 percent flood is, therefore, chosen to be the design flood. The method by which the 1 percent flood is determined is discussed in Appendix 3.

For the reach of Calabazas Creek under study, the 1 percent flood is determined to be 3000 c.f.s. It can be seen from Table 1, flood flows approaching the 1 percent flood have occurred during the past 32 years. Therefore, it is reasonable to assume that future flows may equal or exceed the 1 percent flood level.

As stated earlier in the report, the channel between Lawrence Expressway and El Camino Real and the culvert under El Camino Real have the capacities to convey the 1 percent flood. But the culverts at Lawrence Expressway, Benton Street, and Pomeroy Avenue do not have such capacities. Table 2 shows a comparison between the flow capacities of these inadequate culverts and the 1 percent flood.

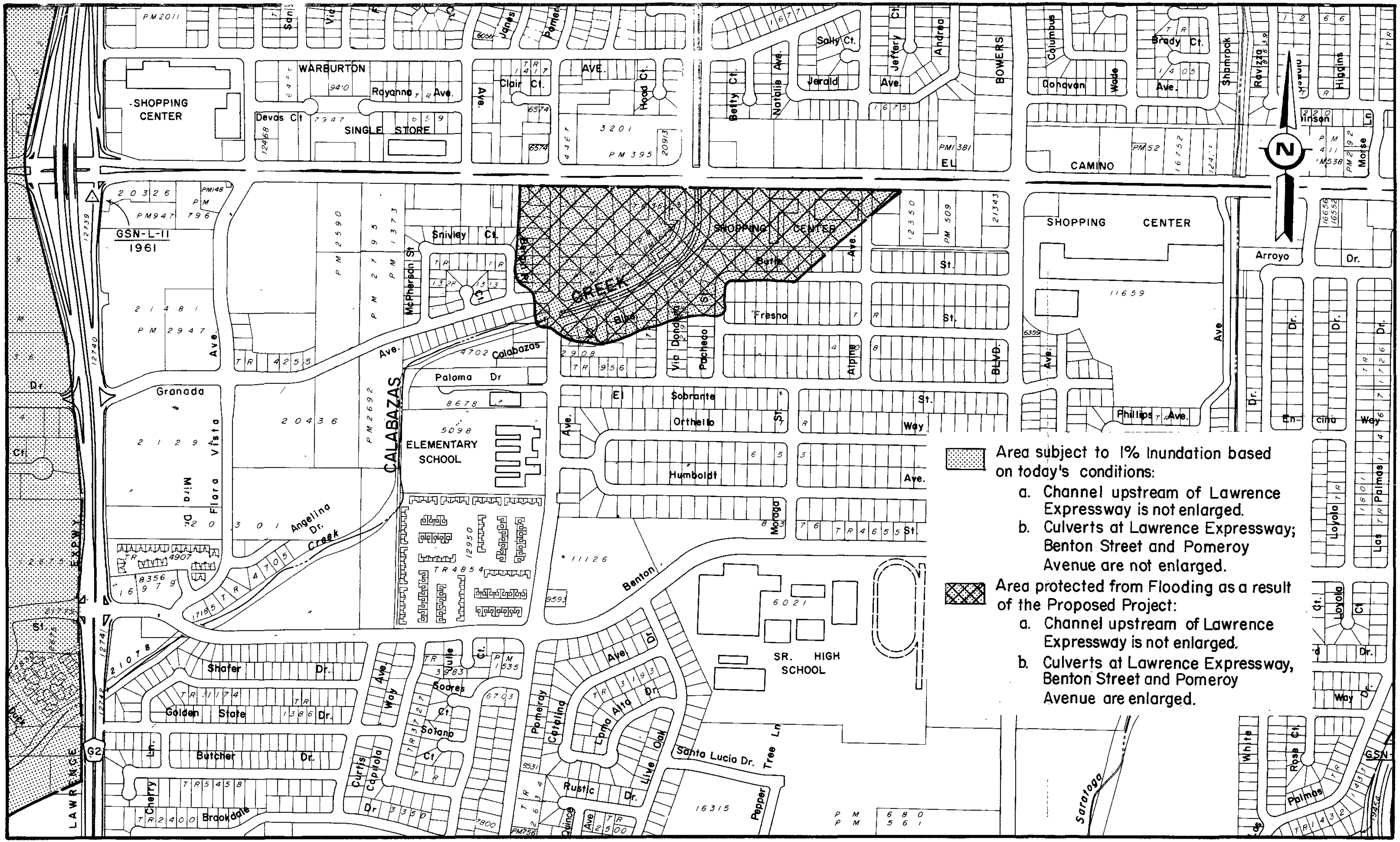
TABLE 2

A COMPARISON BETWEEN FLOW CAPACITIES OF CULVERTS AND THE 1% FLOOD CALABAZAS CREEK

Culvert at	Culvert Flow Capacity (cfs)	1% Flood (cfs)	% Capacity
Lawrence Expressway	2300	3000	76.6
Benton Street	2500	3000	83.3
Pomeroy Avenue	1900	3000	63.3

Based on today's conditions however, it should be pointed out that the 1 percent flood will not reach the channel between Lawrence Expressway and El Camino Real. This is because the channel upstream of Lawrence Expressway is too small. It can only convey up to 2300 c.f.s. The rest of the floodflows will break out and cause flooding upstream. Some flooding will occur in the lower reach also. The problem of the upstream flooding will be discussed in a separate report because the channel upstream of Lawrence Expressway requires extensive study before the flooding problem can be solved. The study of this upstream reach is expected to be completed in 1980 and the construction started in 1981.

The flooding in the lower reach (Pomeroy Avenue to El Camino Real) is due to the undersized culvert at Pomeroy Avenue. This culvert has the smallest capacity (1900 c.f.s.) compared to the flow capacities of the channel upstream of Lawrence Expressway and the culverts at Lawrence Expressway and Benton Street. Flows delivered from the upstream channel will pass through the culverts at Lawrence Expressway and Benton Street. But at Pomeroy Avenue, the water will rise above the inadequate culvert and flow across the street, thus inundating the areas shown in Figure 4A. It is estimated that about 32 acres of land will be affected by this



▨ Area subject to 1% Inundation based on today's conditions:

a. Channel upstream of Lawrence Expressway is not enlarged.
b. Culverts at Lawrence Expressway; Benton Street and Pomeroy Avenue are not enlarged.

▩ Area protected from Flooding as a result of the Proposed Project:

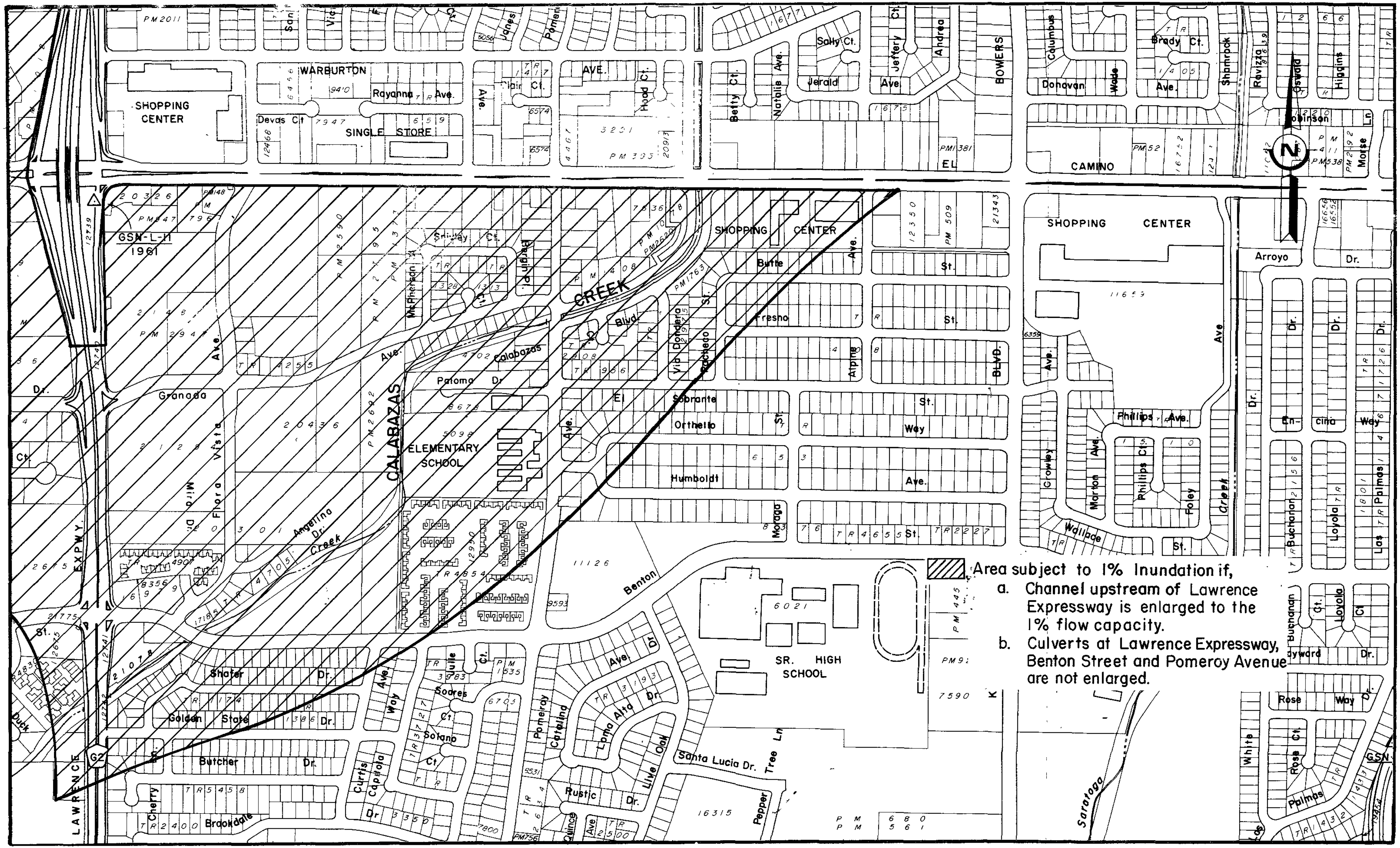
a. Channel upstream of Lawrence Expressway is not enlarged.
b. Culverts at Lawrence Expressway, Benton Street and Pomeroy Avenue are enlarged.

NOTE: The Flood Prone Areas Indicated On This Map Were Established For Use In Economic Studies For Potential Flood Control Projects For Calabazas Creek. The Flood Prone Areas Are Generalized In Pattern And Should Not Be Used To Determine Depths Or Extent Of Flooding For Specific Locations Since Topography Was Limited To Spot Elevations And U.S.G.S. Quadrangle Sheets.

FIGURE 4A
CALABAZAS CREEK
1% FLOODING MAP#1
SCALE: 1" = 500'

flooding. Within this land are several single family homes, apartment buildings, shopping centers, office buildings, and many municipal facilities, such as streets, sewers and water lines. The depth of flooding will vary between zero and three feet.

Even though the culverts at Lawrence Expressway and Benton Street are adequate under today's conditions and will not cause flooding due to the limited capacity of the upstream channel, they need to be enlarged to the 1 percent flow capacity. If they are not enlarged prior to enlarging the channel upstream of Lawrence Expressway, the area subject to flooding will increase substantially. Figure 4B shows the approximate limits of flooding. However, it should be pointed out that such a condition would never occur since the policy of the Water District is to make the lower reach adequate before undertaking any flood control work on the channel upstream that would increase flooding downstream. The project, when completed, will protect the area between Pomeroy Avenue and El Camino Real from flooding. It will also make the entire study reach (Lawrence Expressway to El Camino Real) adequate for the 1 percent flood.



▨ Area subject to 1% Inundation if,

a. Channel upstream of Lawrence Expressway is enlarged to the 1% flow capacity.

b. Culverts at Lawrence Expressway, Benton Street and Pomeroy Avenue are not enlarged.

NOTE: The Flood Prone Areas Indicated On This Map Were Established For Use In Economic Studies For Potential Flood Control Projects For Calabazas Creek. The Flood Prone Areas Are Generalized In Pattern And Should Not Be Used To Determine Depths Or Extent Of Flooding For Specific Locations Since Topography Was Limited To Spot Elevations And U.S.G.S. Quadrangle Sheets.

FIGURE 4B
CALABAZAS CREEK
1% FLOODING MAP #2
SCALE : 1" = 500'

ALTERNATIVE SOLUTIONS STUDIED

This section of the report presents the range of possible solutions, the specific alternatives studied, the estimated costs for these alternatives, and the merits of each alternative.

Range of Possible Solutions

Generally, there are three recognized methods of solving the flooding and erosion problems along a stream. One method is to restrict from the natural floodplain of the stream all buildings and other structures that could possibly be damaged from flooding, siltation, or erosion. This is the so-called "floodplain management" technique. This method generally works well where streams have well-defined floodplains, buildings have not yet been built within the floodplains, and land values are not too high. This method can be used by an agency which has the land use and zoning power, such as a city or county. The Water District does not have the power to enact land use regulations. However, when this alternative appears to be the best solution to a flooding problem, the Water District will recommend to the local jurisdiction that floodplain zoning be adopted.

A variation of floodplain management, although not a solution to physical flooding and erosion problems, is flood insurance. The National Flood Insurance Program,[1] established by Congress in 1968, makes flood insurance available to the cities and counties who choose to join the program at the subsidized rates. To join the program, a city must designate flood hazard areas, and adopt and enforce floodplain management measures.

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[1] See Appendix 4

Another method is to reduce flood flows by means of reservoirs or diversions. Reservoirs store flood flows for later release while diversions remove flood flows from the stream and divert them into other streams. This method generally works well when there are good sites for the construction of dams or when there is a nearby stream which has the capacity to carry the excess flood flows.

A third method is to construct channels big enough to convey the flood flows. This is commonly known as the channelization method. The channel is sized to convey, without flooding or erosion, all the flood flows that could be expected to reach the site during the design flood. Examples of this method are excavated earth channels, underground conduits, concrete-lined channels, rock-lined channels, gabion-lined channels, and combinations or variations of these methods.

Each flood and erosion-prone area must be analyzed to determine which method is best suited to solve the particular problems of the area. Factors such as physical features, property ownership, environmental restraints, economic realities, financial limitations, social attitudes, community desires, and other political considerations greatly affect the type and method of protection a problem area should receive. All these factors narrow the practical alternatives to a manageable few. From these alternatives, the optimum project is selected.

For a number of reasons, Calabazas Creek from Lawrence Expressway to El Camino Real is best served by the third method, that is, making the channel large enough to carry the expected flood flows.

The reach of Calabazas Creek discussed in this report does not have an easily definable natural floodplain. Once floodwaters leave the existing channel, these waters spread over the flat valley floor. The highly developed residential and commercial properties in the vicinity of the channel make the first method highly impractical.

Numerous reports have discussed the feasibility of upstream reservoirs on Calabazas Creek. None of these reports identified an economically suitable site for a reservoir. Moreover, there are no streams with excess capacity reasonably nearby to which excess flood flows from Calabazas Creek could be diverted. These two factors make the second method equally impractical.

It is apparent that the channelization is the only solution left to solve the flooding problem. Therefore, this is the solution selected for this project.

Descriptions of Alternatives Studied

Two specific alternatives were studied to solve the flooding problem in the subject reach of Calabazas Creek. Since the flooding problems are caused by inadequate culverts, these alternatives differ principally in the treatment of water openings at Lawrence Expressway, Benton Street, and Pomeroy Avenue.

Alternative 1 - Enlargement of Street Culverts by Constructing Additional Box Culvert Cells

This alternative is the construction of additional box culvert cells adjacent and parallel to the existing structures.

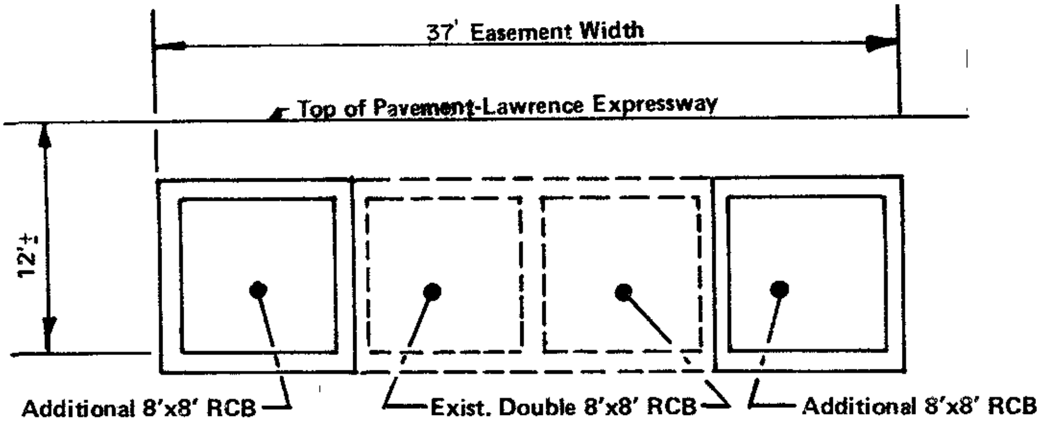
Under Lawrence Expressway, an 8-foot-wide by 8-foot-high box culvert would be required on each side of the present structure.

Under Benton Street, an additional 8-1/2-foot-wide by 8-foot-high box culvert would provide the desired flow capacity.

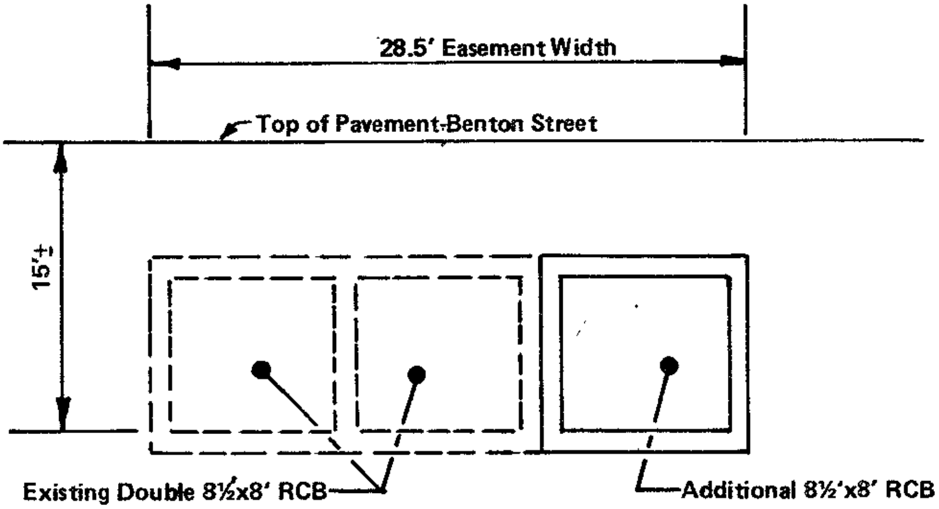
Under Pomeroy Avenue, an additional 12-foot-wide by 11-foot-high box culvert would be required.

In addition to the above work, all inlet and outlet transitions would have to be removed and reconstructed to be wide enough to fit the new box culverts.

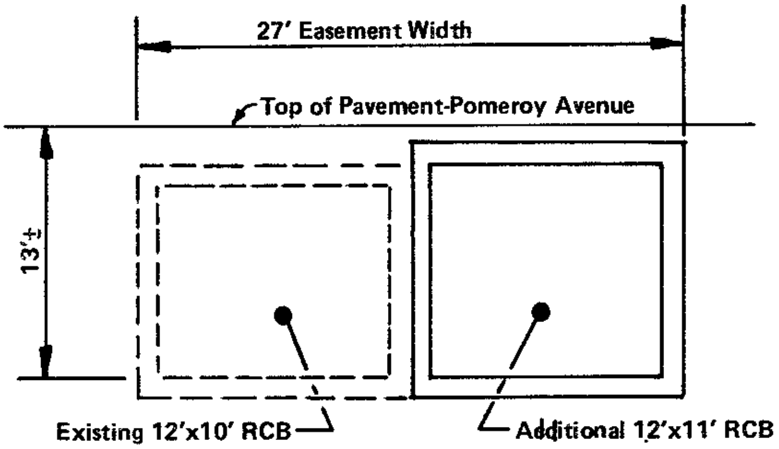
The total right of way easements needed for this alternative are the strips approximately 37 feet wide at Lawrence Expressway, 28.5 feet wide at Benton Street and 27 feet wide at Pomeroy Avenue. Figure 5 shows the typical cross-sections of this alternative.



LAWRENCE EXPRESSWAY



BENTON STREET



POMEROY AVENUE

FIGURE 5. ENLARGEMENT OF STREET CULVERTS WITH ADDITIONAL BOX CULVERT CELLS-ALTERNATIVE 1
(All Sections Looking Downstream)

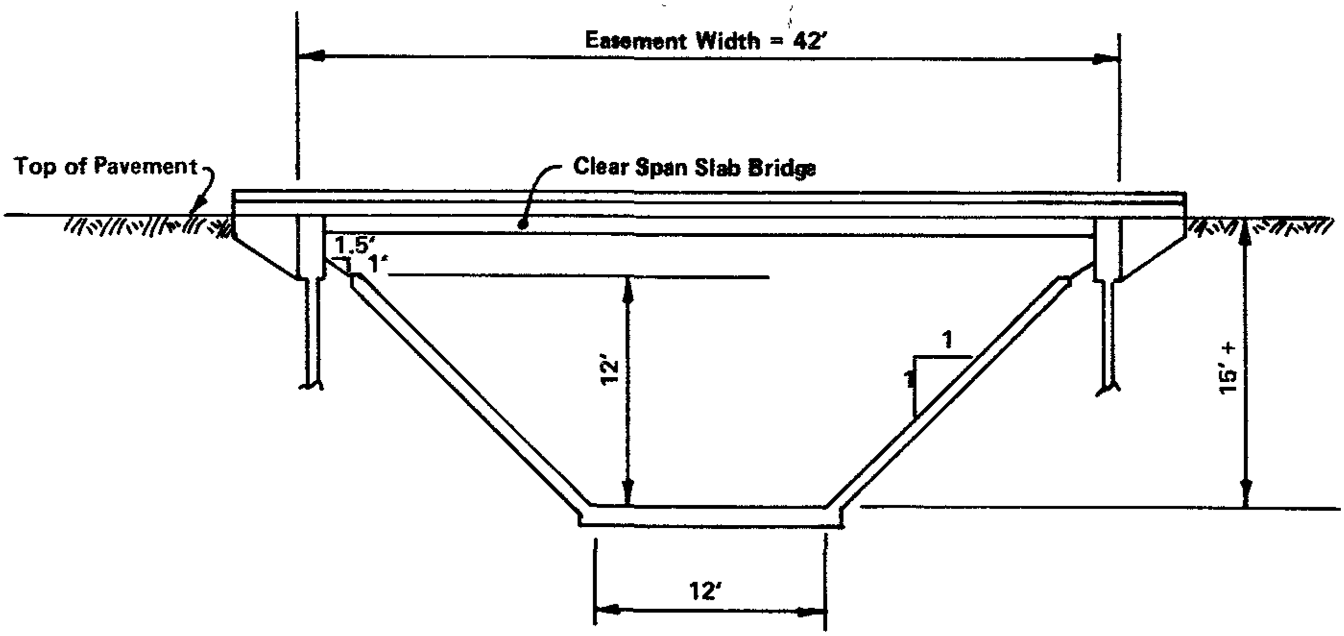
Alternative 2 - Replacement of Street Culverts with Clear-Span Bridges

Under this alternative, the culvert at Lawrence Expressway would be enlarged as stated in Alternative 1. However, the box culverts under Benton Street and Pomeroy Avenue would be removed and replaced with clear-span bridges. The channel under the new bridges would be lined with concrete. The lined channel would be trapezoidal in shape having a base width of 12 feet and side slopes of one horizontal to one vertical. The depths of the channel lining would be 12 feet at Benton Street and 11 feet at Pomeroy Avenue. With this alternative, the inlet and outlet transitions at Benton Street and Pomeroy Avenue would be removed and replaced with channel lining, but the transitions at Lawrence Expressway would be reconstructed with larger transitions as in Alternative 1.

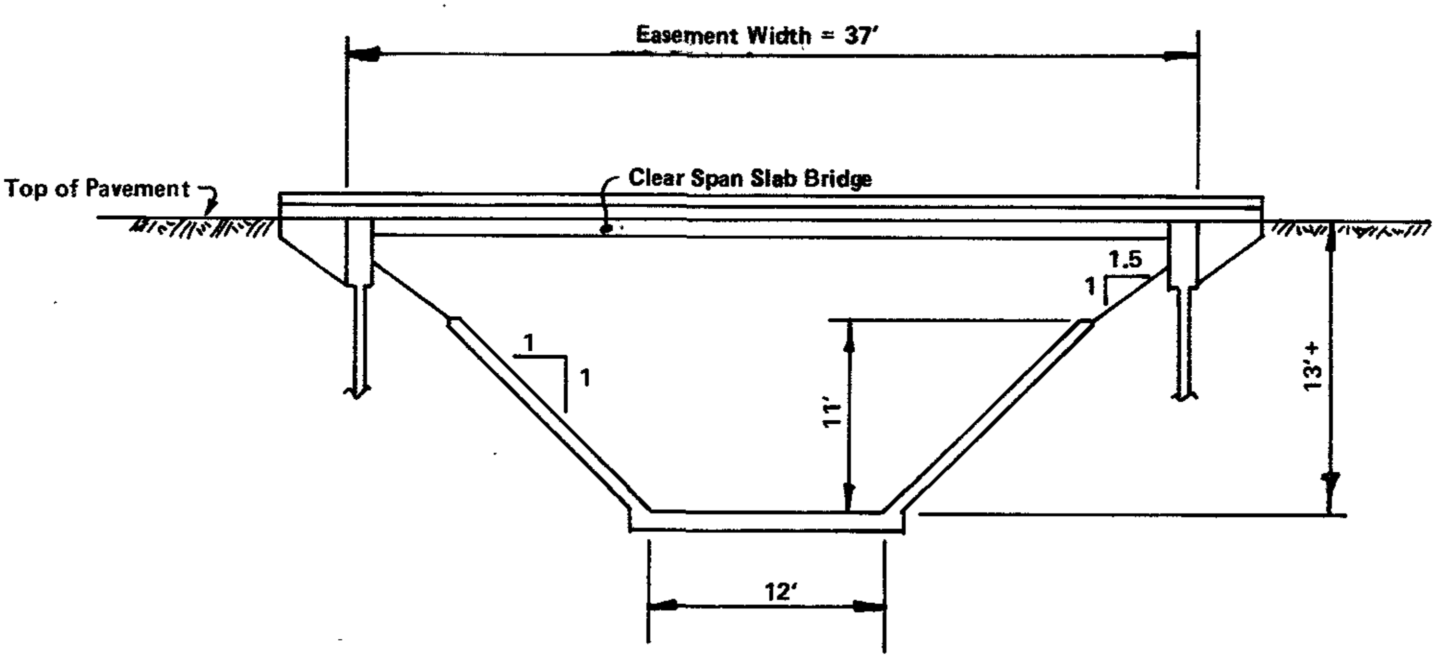
The total right of way easements needed for this alternative would be the strips approximately 42 feet wide at Benton Street and 37 feet wide at Pomeroy Avenue. Figure 6 shows the typical cross-sections of this alternative.

Estimated Costs for Alternatives

The estimated costs for Alternatives 1 and 2 are shown in Table 3. These costs are broken down into three categories; 1) construction, 2) engineering, inspection and contingencies, and 3) rights of way. The total project cost is a summation of costs for these three categories. Construction costs include all labor and material needed to build each alternative.



BENTON STREET



POMEROY AVENUE

FIGURE 6. REPLACEMENT OF STREET CULVERTS WITH CLEAR–SPAN BRIDGES-ALTERNATIVE 2
(All Sections Looking Downstream)

A preliminary plan, a list of work and materials, and a construction cost estimate were prepared for each of these alternatives. Unit prices from which the construction cost estimates were computed are taken from the most recent (Spring 1977) unit prices bid for similar District projects to which the cost of inflation (6%±) was added to reflect the 1978 prices.

The right of way costs for both alternatives are zero. No additional lands will be required except for easements needed to maintain the water openings at the three culverts.

TABLE 3

ESTIMATED COSTS FOR ALTERNATIVES

Alternative No.	Construction	Engineering, Inspection, Contingencies (35%)	Right of Way	Total
1. Construct additional box culvert cells				
A. Lawrence Exp.	$271,000	$ 94,850	$0	$365,850
B. Benton Street	122,000	42,700	0	164,700
C. Pomeroy Avenue	161,000	56,350	0	217,350
	$554,000	$193,900		$747,900
2. Replace culverts with clear-span bridges				
A. Lawrence Exp.*	$271,000	$ 94,850	$0	$365,850
B. Benton Street	215,000	75,250	0	290,250
C. Pomeroy Avenue	250,000	87,500	0	337,500
	$736,000	$257,600		$993,600

* See Page 21

Evaluation of Alternatives 1 and 2

From a purely economic standpoint, Alternative 1 would cost about $245,700 less to build than Alternative 2. However, visually, Alternative 2 would be more attractive than Alternative 1.

For both alternatives, construction would have to be done in stages to minimize the disruption of traffic. Neither alternative would cause any serious environmental damage[1] except for temporary nuisance during construction. The annual maintenance costs and the cost of modifications to the existing fencing, landscaping, maintenance roads, and the utilities, such as gas, electric, telephone, water and sewer lines would be the same in both alternatives.

Alternative Selected

The alternative selected for this project is Alternative 1 - Enlargement of Street Culverts by Constructing Additional Box Culvert Cells. The reason for selecting this alternative is its lower cost. It will be about 18 percent cheaper to build than Alternative 2. Although visually this alternative would be relatively less attractive than Alternative 2, the additional $245,700 needed to construct Alternative 2 is not justified.

The following section describes the specific elements needed to construct the proposed project (Alternative 1).

---

[1] See Appendix 5 - Negative Declaration.

PROPOSED PROJECT

Project Description

The proposed project consists of constructing the additional box culvert cells adjacent and parallel to the existing box culverts under Lawrence Expressway, Benton Street and Pomeroy Avenue. A general plan of the proposed project is shown on the plates that follow the text of this report.

Under Lawrence Expressway an additional 8-foot-wide by 8-foot-high box culvert is proposed on each side of the existing double box culvert. The length of the new box culverts will be 152 feet. The inlet transition will be removed and replaced with a new transition. The length of the new transition will be 35 feet, of which about 10 feet will be sacked concrete and the rest will be reinforced concrete. The outlet transition and the drop structure just downstream of this crossing will also be removed and replaced with a longer transition and a wider drop structure to accommodate the extra widths of the box culverts.

Under Benton Street, an additional 8-1/2-foot-wide by 8-foot-high box culvert will be constructed on the east side of the existing culvert. The length of the new box culvert will be 146 feet. The inlet and outlet transitions and the drop structure just northeast of this crossing will be modified to accommodate the extra width of the box culvert.

The box culvert under Pomeroy Avenue will also be enlarged by constructing an additional 12-foot-wide by 11-foot-high box culvert on the south side of the present structure. The length of this new box culvert will be 62 feet. The inlet and outlet transitions and portions of adjoining channel lining will be removed and replaced with longer transitions to accommodate the extra width of the box culvert and to provide smooth passage for the flood flows.

The project will require the relocation of several utilities. Water, sewer, gas, electric and telephone lines interfere with the project. Some of these utilities will be relocated prior to construction while others will be relocated during construction.

The existing fencing, maintenance roads, and ground cover in the vicinity of the project will be modified during construction.

Prior to construction, the agencies having jurisdiction over the street culverts will be contacted to assist in the preparation of the detailed detour design. Detours will be provided where needed to facilitate traffic movement during construction. The project may be constructed in two or more stages to minimize the inconvenience to the public.

Project Costs and Financing

The cost of the project is estimated to be $747,900. This cost estimate is based on Spring 1978 prices, and it includes the cost of construction and utility relocation, the engineering design cost (10 percent of the construction cost), the construction inspection cost (15 percent of the construction cost), and the cost of contingency items such as legal fees, printing, clerical, and overhead (10 percent of the construction cost). A more detailed breakdown of the project costs is shown in Table 4.

TABLE 4

DETAILED BREAKDOWN OF THE PROJECT COSTS

Item	Construction	Engineering & Inspection @ 25%	Contingencies @ 10%	Total
Mobilization	$ 20,000	$ 5,000	$ 2,000	$ 27,000
Detour and Traffic Control	41,000	10,250	4,100	55,350
Demolition of Transitions & Drop Structures	39,000	9,750	3,900	52,650
New Concrete Structures	348,000	87,000	34,800	469,800
Pavement Removal & Restoration	75,000	18,750	7,500	101,250
Utility Relocation & Misc. Items	31,000	7,750	3,100	41,850
Total	$554,000	$138,500	$55,400	$747,900

The project can be financed from the ad valorem tax in the North Central Zone of the District.

Project Schedule

Construction is scheduled to start in the Summer of 1978 and completed by the Summer of 1979.

CONCLUSIONS AND RECOMMENDATIONS

As a result of the study discussed in this report for the reach of Calabazas Creek between Lawrence Expressway and El Camino Real, the District staff concludes that:

1. Enough water from a 1 percent flood can reach the inadequate box culvert at Pomeroy Avenue to cause flooding in the vicinity of Pomeroy Avenue.

2. The culverts at Lawrence Expressway and Benton Street are not adequate to pass the 1 percent flood. However, a 1 percent flood will not reach Lawrence Expressway until Calabazas Creek is enlarged upstream of Lawrence Expressway. (Enlarging the channel upstream of Lawrence Expressway is the subject of a separate report).

3. The channel upstream of Lawrence Expressway cannot be enlarged until the culverts at Lawrence Expressway, Benton Street, and Pomeroy Avenue are enlarged to pass the 1 percent flood.

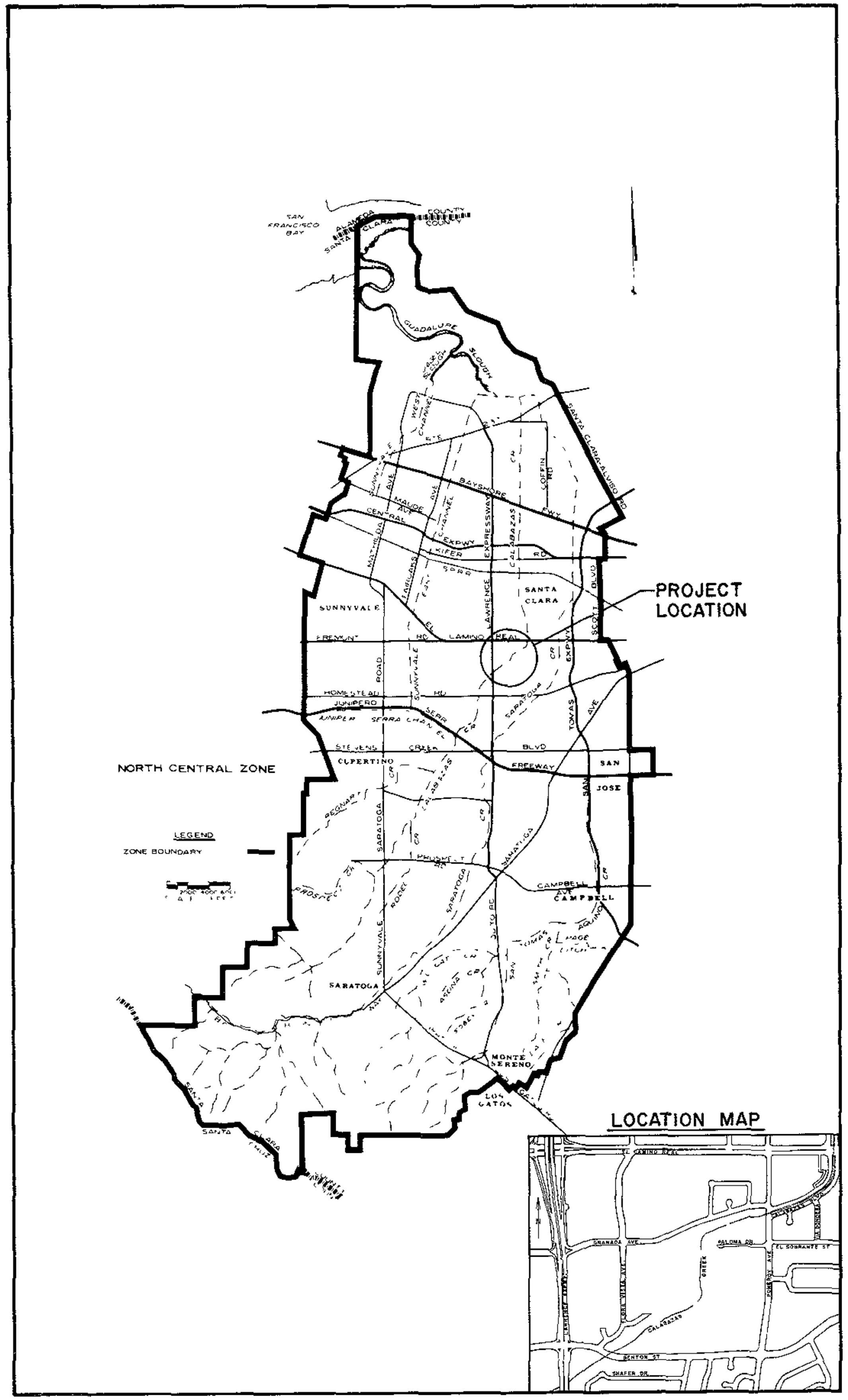
4. The channel between Lawrence Expressway and El Camino Real is adequate for the 1 percent flood. The box culvert at El Camino Real is also adequate. Therefore, these facilities should be left undisturbed.

5. The most economical and feasible long-term solution to the flooding problem is to increase the capacity of the culverts at Lawrence Expressway, Benton Street and Pomeroy Avenue.

6. Alternative 1 is the least expensive type of construction.

7. The estimated cost of the project (Alternative 1) is $747,900. When completed, it will protect the area between Pomeroy Avenue and El Camino Real from flooding. It will also make the study reach adequate for the 1 percent flood. However, the area southwest of Lawrence Expressway will continue to be subject to the 1 percent flood until additional work is done on the channel upstream of Lawrence Expressway.

It is recommended that the project, as proposed here, be approved and that the staff be authorized to prepare detailed plans and specifications for construction.



MAP AND GENERAL PLAN

FOR

CALABAZAS CREEK

FROM

LAWRENCE EXPRESSWAY TO EL CAMINO REAL

Santa Clara Valley Water District

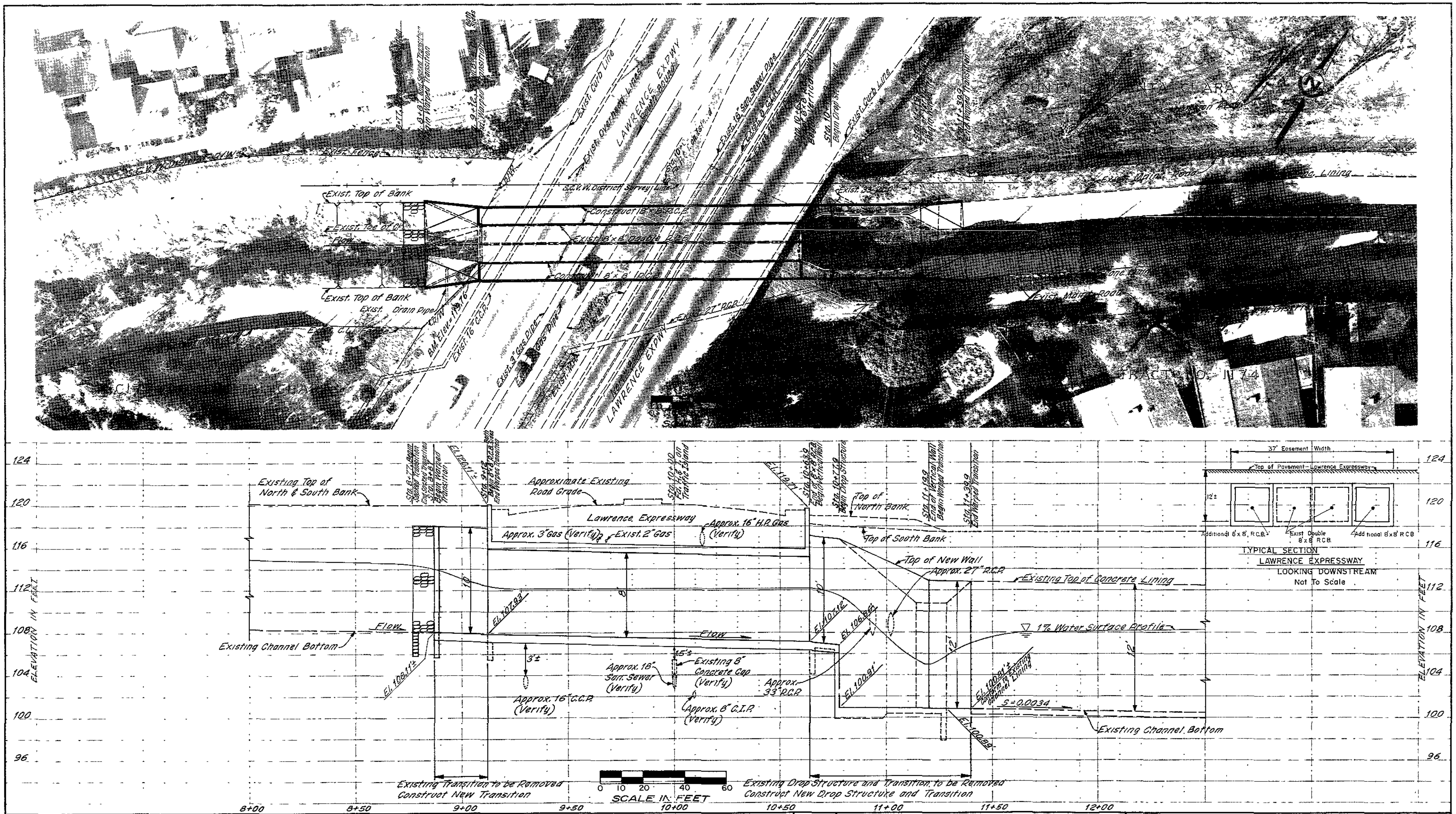
NORTH CENTRAL FLOOD CONTROL ZONE **PROJECT NO. 2010**

PROJECT APPROVAL

George Korbay
DESIGN AND CONSTRUCTION MANAGER

Lloyd C. Fowler
CHIEF ENGINEER

DATE 21 Feb '78



REFER TO TRACING FOR LATEST REVISION

REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

DATE OF PHOTOGRAPHY 12-17-76

1. T.B.M. - 3 WKP, Disk D/S Lawrence Expressway, Elev. 117.89

DATE 2-1-78
DESIGN KAWAOKA YUNG
DRAWN F.S.W.
CHECKED A.P.M.

Santa Clara Valley Water District

ENGINEERING CERTIFICATION
Arnold Moby
PROJECT ENGINEER
Bruce Wilson
DIVISION ENGINEER

ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH

ZONE NC-1

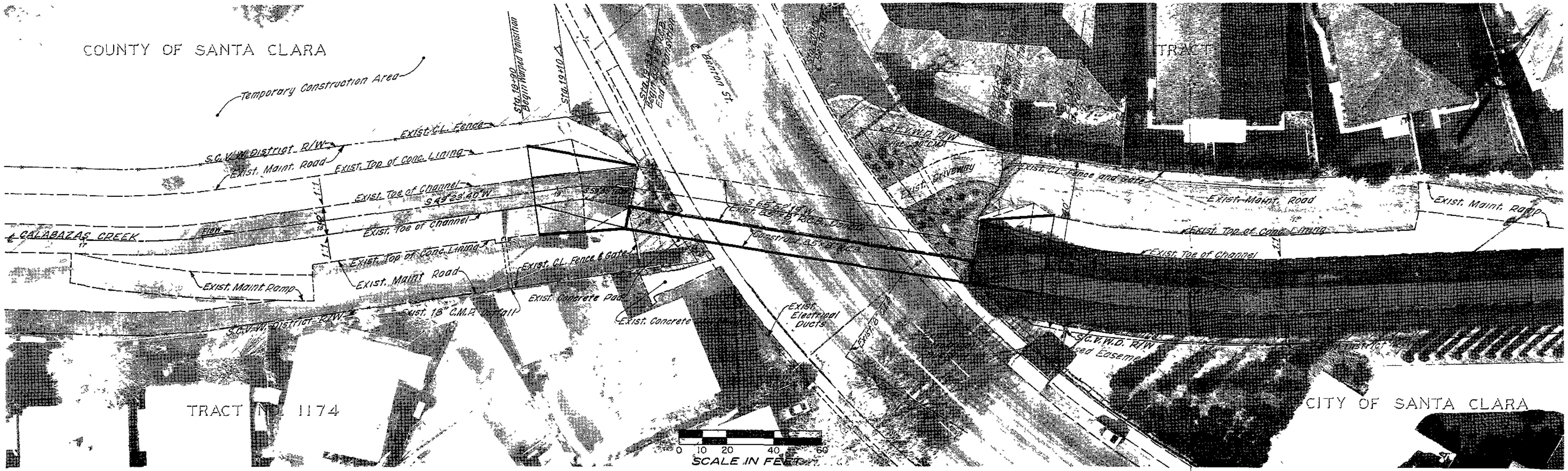
CALABAZAS CREEK

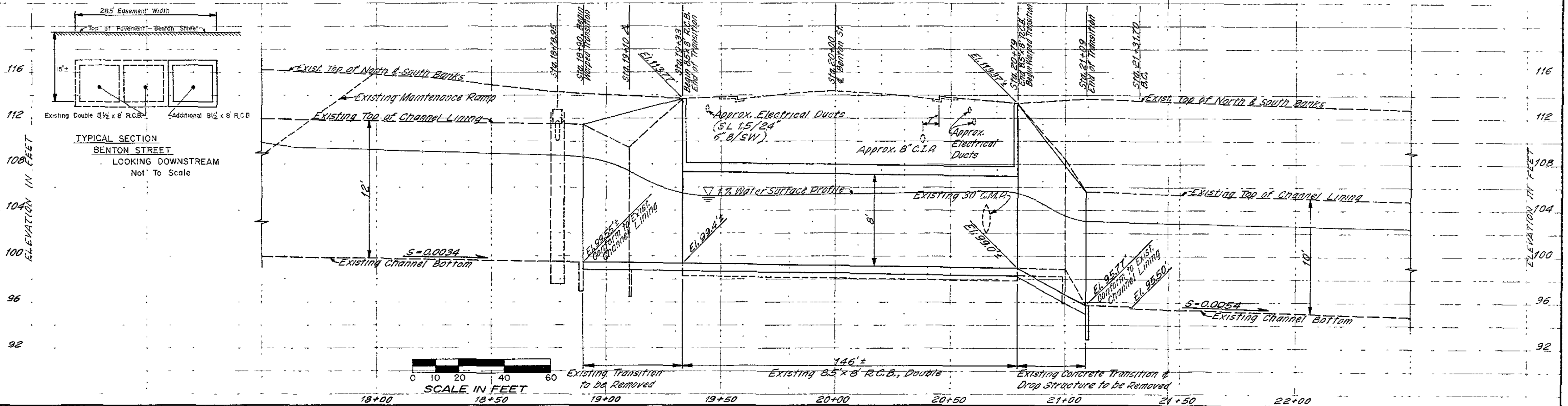
PLAN AND PROFILE

LAWRENCE EXPRESSWAY

SCALE Hor. 1"=20' Ver. 1"=4'

PLATE 2




28.5' Easement Width
Top of Pavement - Benton Street
15'±
Existing Double 8½' x 8' R.C.B.
Additional 8½' x 8' R.C.B.
TYPICAL SECTION
BENTON STREET
LOOKING DOWNSTREAM
Not To Scale
ELEVATION IN FEET
116
112
108
104
100
96
92
Exist. Top of North & South Banks
Existing Maintenance Ramp
Existing Top of Channel Lining
12'
S=0.0034
Existing Channel Bottom
Sta. 18+73.95
Sta. 18+90 Begin Warped Transition
Sta. 19+10
El. 113.7'
Sta. 19+33 Begin 8.5'x8' R.C.B. End of Transition
Sta. 20+00 ℄ Benton St.
El. 113.8'
Sta. 20+79 End 8.5'x8' R.C.B. Begin Warped Transition
Sta. 21+09 End of Transition
Sta. 21+31.70 B.C.
El. 99.55'± Conform to Exist. Channel Lining
El. 99.4'±
Approx. Electrical Ducts (SL 1.5/24" 6" B/SW)
Approx. 8" C.I.P.
Approx. Electrical Ducts
1% Water Surface Profile
8'
Existing 30" C.M.P.
El. 99.0'±
El. 95.77' Conform to Exist. Channel Lining
El. 95.50'
Exist. Top of North & South Banks
Existing Top of Channel Lining
10'
S=0.0054
Existing Channel Bottom
146'±
Existing Transition to be Removed
Existing 8.5'x8' R.C.B., Double
Existing Concrete Transition & Drop Structure to be Removed
0 10 20 40 60
SCALE IN FEET
18+00
18+50
19+00
19+50
20+00
20+50
21+00
21+50
22+00

REFER TO TRACING FOR LATEST REVISION			
REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

DATE OF PHOTOGRAPHY 12-17-76

1. Bench Marks
   - A Brass Plate at the Top and Southerly Side of the Upstream Headwall on the Pomeroy Ave. R.C.B. Elev. 93.26
   - B U.S.G.S. #3 WKP at the Top and Southwest Side of the Upstream Headwall on the Lawrence Expwy R.C.B. Elev. 119.76

DATE 2-1-78
DESIGN KAWAOKA YUNG
DRAWN F.S.W.
CHECKED A.P.M.

Santa Clara Valley Water District

ENGINEERING CERTIFICATION
Arvind Mody
PROJ. ENGINEER R.C.E. NO. 23
Bruce Wilson
DIVISION ENGINEER R.C.E. NO.

ENGINEER NC APPROVAL
Edwin Ferguson
HEAD DESIGN BRANCH R.C.E. NO.

ZONE NC-1

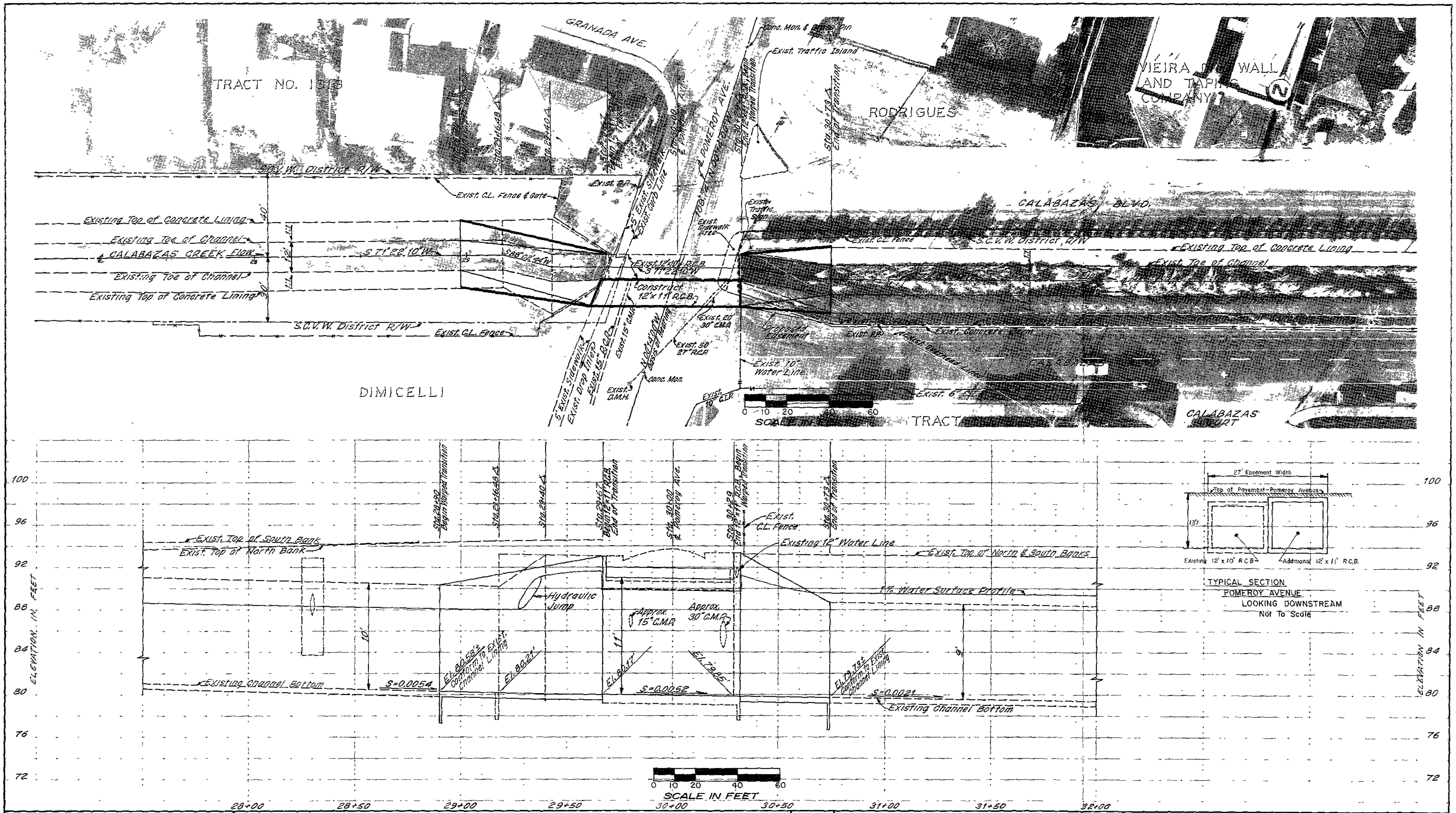
CALABAZAS CREEK

PLAN AND PROFILE

BENTON STREET

SCALE Hor. 1"=20' Ver. 1"=4'

PLATE 3



TYPICAL SECTION
POMEROY AVENUE
LOOKING DOWNSTREAM
Not To Scale

REFER TO TRACING FOR LATEST REVISION			
REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

DATE OF PHOTOGRAPHY 12-17-76

DATE 2-1-78
DESIGN KAWAOKA YUNG
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Santa Clara Valley Water District

ENGINEER NO. CERTIFICATION
Arvind Mody
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ZONE NC-1

CALABAZAS CREEK
PLAN AND PROFILE
POMEROY AVENUE

SCALE
Hor. 1"=20'
Ver. 1"=4'

PLATE
4

APPENDICES

APPENDIX I

Glossary of Terms Used in this Report

Acre-Foot - The volume of water it takes to cover one acre of land to a depth of one foot (approximately 325,000 gallons).

Channel - That portion of a stream system that contains the normal flows.

Cubic-Foot-Per-Second (cfs) - A volume of water equivalent to one cubic-foot passing a point during one second (approximately 450 gallons/minute).

Flood Flows - Those flows of water that cannot be contained within the stream channel.

One Percent (1%) Flood - The flood that has a 1% chance of being equaled or exceeded in any one year (explained in more detail in Appendix 3).

Urbanization - A development of land with houses, roads, parks, schools and shopping center.

Watershed - The area that drains into a body of water.

APPENDIX 2

Who To Contact for More Information

About this Report

Arvind P. Mody
Project Engineer
Santa Clara Valley Water District
265-2600

About Flood Insurance

Carroll Church
Santa Clara Valley Water District
265-2600

About Floodplain Zoning

County Zoning Administrator
Santa Clara County Planning Department
299-2591

About Environmental Considerations

Dr. Bernard Goldner
Santa Clara Valley Water District
265-2600

About Creek Maintenance

Donald Erling
Santa Clara Valley Water District
265-2600

APPENDIX 3

The One Percent Flood

The one percent flood is that flow of water from a drainage area that has a one percent chance (probability of 0.01) of occurring in any given year. It is equivalent to the so-called 100-year flood, but it should not be thought of as an event that occurs regularly every 100th year. Instead, it is the flood flow event that would be equaled or exceeded about 100 times in 10,000 years. It is also possible that two repetitions of this flood flow could occur in a single year, or that a single event may not occur even once in 200 years.

The "one percent flood" is the preferred description of the design flood. However, the term "100-year flood" is equivalent. Unfortunately, this latter term often leads to the misconception that the design flood occurs only every 100th year.

Another terminology problem is the relation of the one percent storm and the one percent flood. The storm magnitude relates to the flood magnitude through a complex set of parameters such as antecedent rainfall conditions, drainage basin shape, length, slope, orientation, and others. Therefore, a one percent storm will not necessarily produce a one percent flood. The one percent flood should not be confused with the one percent storm, nor should it be referred to as the one percent storm flood.

The one percent flood has a small risk of occurrence in a given year, but this risk is cumulative. When compared with the 30-year life of the average home loan, for example, the chance that it will occur is quite large. During the 30-year loan period, the chance that a one percent flood will occur, or be exceeded, approaches 30 percent.

The magnitude of the one percent flood must be calculated by using statistical hydrological (stochastic) methods. Since it is the desire of the District to provide equal protection from flooding to all residents, a uniform method of determining design flood flows is required; one that is regional in scope and one that minimizes the chance of providing unequal protection from one area to another. This objective is reached through a regional peak flood frequency analysis that uses the best available hydrologic data from stream systems in and adjacent to the District. The regional process utilized by the District was developed after considerable effort and has been reviewed and approved by the academic and professional community.

The research on the statistical measurement of flood flows and frequencies has shown that the larger magnitude floods that occur at relatively infrequent intervals, such as the one percent flood, are products of extremely heavy rainfalls, either of exceptionally high intensity or of long duration. With exceptionally high-intensity rainfall, so much rain falls in a short period of time that no matter what the ground cover is - soil, pavement, grass, trees, or buildings - the water cannot be stored or soaked up, and it runs off in a flood. With long-duration rainfall, a lot of rain falls, but it comes over a long period of time. Bare soil, grassland, forests, landscaping, house roofs, and pavement become fully saturated, and flooding occurs when no more water can be absorbed, stored, or evaporated.

Thus, for large floods, the type of development or degree of urbanization existing in the watershed is of little consequence.

However, the situation is different for the small magnitude floods, which occur at frequent intervals. In these, the rainfall intensity is less or of shorter duration. The absorption, holding, or storage characteristics of the land are much more important. With much less water present, soil, grass, and forests tend to soak up and hold back the rain that falls, while pavement and house roofs let a large percentage run off.

Therefore, when grassland is converted to pavement, the amount of water that runs off is much greater for the small amounts of rainfall. The magnitude of the small, more frequent type of flood flow is increased by urbanization.

In discussing flood flows and urbanization, one additional factor should be mentioned. This is over-bank storage in floodplain areas. Where urbanization occurs in the floodplain and the stream is channel, the storage of overbank floodwaters is reduced. This reduction results in greater downstream flood flows. This increase in flood flows occurs for any magnitude or frequency of flooding that would have resulted in channel overflow and storage of waters in the floodplain.

Lloyd C. Fowler
27 June 1974

APPENDIX 4

The National Flood Insurance Program

Natural disasters have, from time to time, created great personal hardships and economic distress. The National Flood Insurance Program was created by the Congress to mitigate the effect on communities and individuals of the most prevalent national disaster, property damage due to floods and flood-related hazards.

Established in 1968 and broadened in 1969, 1973, and 1975, the Program enables property owners to acquire flood insurance at reasonable rates through a cooperative program with the private insurance industry. Before property owners can obtain such flood insurance, the local community (City or County) must join the Program. Joining in the Federal Program requires that those communities with designated flood hazard areas adopt and enforce floodplain management measures that will diminish the impact of future floods. In these communities, the availability of federally-related funding for property located in a designated flood hazard area (example: loans by banks) is conditioned upon the purchase of flood insurance.

Once a community has joined the Program, property owners throughout the community can purchase subsidized insurance to cover structural losses up to $35,000 for a single-family dwelling, $100,000 for a multi-unit dwelling, and $100,000 for nonresidential structures. The annual rate for residential dwellings is $0.25 per $100 of value and for other structures, $0.40 per $100 of value.

Content losses up to $10,000 for residential units and $100,000 for nonresidential units can also be covered at annual rates of $0.35 and $0.75 per $100 of value, respectively. Following the development of flood data needed to fully-define floodplain management measures and the adoption and enforcement of those measures by the local community, an equal additional amount of nonsubsidized insurance (at acturial rates) will be made available. The acturial rates vary, based on the degree of risk; however, the maximum annual rate for single-family dwellings is $0.50 per $100 of value.

Further details about the Federal Flood Insurance Program can be obtained from the Santa Clara Valley Water District and the Flood Insurance Office of the Department of Housing and Urban Development, San Francisco 94102, phone 415-556-3543.

November 12, 1975

APPENDIX 5

NEGATIVE DECLARATION

Project: Proposed Flood Control Measures on Calabazas Creek, Project No. 2010, North Central Flood Control Zone.

Location: The reach of Calabazas Creek between Lawrence Expressway and El Camino Real in the City of Santa Clara (see Figure 1, Engineer's Report).

Purpose: The proposed project will protect the community within the floodplain of this reach of Calabazas Creek from the one percent flood. Surrounding major land uses include single- and multi-family residential dwellings, light commercial development, shopping centers, and an elementary school.

Finding: Based on an Initial Study (attached) of the project pursuant to Section 15080 of the State EIR Guidelines, staff has determined that the proposed project will not have a substantial adverse impact on the environment. Therefore, a Negative Declaration is appropriate.

Basis of Finding: The adverse impacts associated with the project will occur during construction activities and are therefore temporary. No long-term or cumulative adverse impacts have been identified. The short-term impacts are excessive noise levels, dust and construction equipment exhaust emissions, and disruption to traffic.

Mitigation measures included in the project are described in the Initial Study.

INITIAL STUDY

ENVIRONMENTAL IMPACT ASSESSMENT CHECKLIST

Explanations of all "Yes" and "Maybe" answers are required on attached sheets. If impact occurs during construction or is temporary, indicate with a "C" or "T" under Yes or Maybe.

	Yes	Maybe	No
1. Geology and Soils. Will the project result in:			
a. An increased hazard to the public resulting from geologic features of the site (landslide-prone areas, faults, slumping, etc.)?			X
b. Serious disruptions, displacements, compaction, or impervious covering of the soil?			X
c. Introduction of toxic materials in the soil or reduction of soil fertility?			X
d. Significant change in topography or ground surface relief features?			X
e. The destruction, covering or modification of any unique geologic or physical features?			X
f. Any substantial increase in wind or water erosion of soils, either on or off the site?			X
g. Changes in siltation, sediment transport, deposition or erosion which may modify a river, stream, or other body of water?			X
2. Air. Will the project result in:			
a. Generation of air emissions (such as dust) that will seriously deteriorate air quality standards (either locally or regionally)?		C	
b. The creation of objectionable odors?			X
c. Major alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?			X

	Yes	Maybe	No
3. *Water*. Will the project result in:			
a. Changes in currents, or the course or direction of water movements?			X
b. Changes in infiltration rates, sedimentation, drainage patterns, or the rate and amount of surface water runoff?	X		
c. Alterations in the course or flow of floodwaters?	X		
d. An increase in downstream flood potential that might cause property damage?			X
e. Change in the amount of surface water in any body of water?	X		
f. Contamination or any detrimental effect on existing water quality or quantities of either surface or subsurface supplies?			X
g. Change in the quantity of groundwaters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?			X
h. Reduction in the amount of water otherwise available for public water supplies?			X
4. *Noise*. Will the project increase existing noise levels during construction or operations to the extent that existing or future residents would be annoyed?	C		
5. *Plant Life*. Will the project result in:			
a. Change in the diversity of species, or numbers of any species of plants (including trees, shrubs, grasses, microflora, and aquatic plants)?			X
b. Reduction of the numbers of any unique, rare or endangered species of plants?			X
c. Introduction of new plant species into an area, or a barrier to the normal replenishment of existing species?			X

	Yes	Maybe	No
6. Animal Life. Will the project result in:			
a. Changes in the diversity of species, or numbers of any species of animals (birds, land animals, including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?			X
b. Loss or disturbance of a nesting area for resident or migrating birds?			X
c. Reduction of the numbers of any unique, rare or endangered species of animal?			X
d. Introduction of new species of animal into an area, or result in a barrier to the migration or movement of animals (or fish)?			X
e. Deterioration of existing fish or wildlife habitat?			X
7. Land Use/Community Plans and Values. Will the project result in:			
a. Alteration or nonconformance with regional, federal, state or local land use plans and policies of the surrounding area?			X
b. Conflict or inconsistency with adopted policies, plans and goals of the community where the project is located?			X
c. Deterioration of the integrity or quality of the surrounding neighborhood? Loss of privacy or security to residents over the long term?			X
d. Generation of a substantial public controversy resulting from environmental concerns?			X

	Yes	Maybe	No
8. Economic. Will the project:			
a. Foster economic or population growth, either directly or indirectly, in the surrounding area (particularly if faster than planned for)?			X
b. Remove a major constraint or obstacle to growth?			X
c. Decrease employment in the community?			X
d. Reduce acreage or yield of an agricultural crop?			X
9. Population. Will the location, distribution, character, or density of the surrounding human population be altered by the project?			X
10. Housing. Will the project adversely affect existing housing or result in the relocation of existing housing?			X
11. Transportation/Circulation. Will the project result in:			
a. An adverse impact upon existing transportation systems?			X
b. Reduction in existing parking facilities, or create demand for new parking?			X
c. Alterations to present patterns of circulation or movement of people and/or goods?	C		
d. Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians?		C	
12. Public Services. Will the project result in a need for new or altered governmental services in any of the following areas:			
a. Fire or police protection?			X
b. Schools?			X
c. Parks or other recreational facilities?			X

	Yes	Maybe	No
d. Maintenance of public facilities (streets, highways, public transit, etc.)?			X
e. Flood Protection?			X
f. Other governmental services?			X
13. Utilities. Will the project result in a need for new systems, or alterations to the following utilities:			
a. Power or natural gas?	T		
b. Communications systems?		T	
c. Water?		X	
d. Sewers or septic tanks?		T	
e. Storm water drainage?		X	
f. Solid waste disposal?			X
14. Energy. Will the project result in:			
a. Use of substantial amounts of fuel or energy?			X
b. Substantial demand upon existing sources of energy, or require the development of new sources of energy?			X
15. Public and Environmental Health. Will the project result in:			
a. Creation of any known human health hazard or potential health hazard (excluding mental health but including physical injury)?			X
b. Involve the application, use, or disposal of toxic or hazardous materials?			X
16. Aesthetics. Will the project result in the obstruction or elimination or any scenic vista or view open to the public, or will the project result in the creation of an aesthetically offensive site or structure presently or potentially open to public view?			X

	Yes	Maybe	No
17. Recreation. Will the project result in an impact upon the quality or quantity of existing recreational opportunities (such as fishing, boating, hiking, horseback riding, bicycling)?			X
18. Archeological/Historical. Will the project result in an alteration of a significant known archeological or historical site, structure, object or building? Is the project in a known archeologically sensitive area?			X
19. Natural Resources. Will the project substantially increase the consumption of an non-renewable natural resource such as minerals, precious metals, prime agricultural land, natural gas, oil, etc.?			X
20. Mandatory Findings of Significance.			
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?			X
b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.)			X
c. Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)			X

	Yes	Maybe	No
d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?			X

Discussion of Environmental Evaluation

1.d. There will be some grading of the ground in the vicinity of the culverts, but it will not affect the topography significantly.

2.a. During construction, air quality is likely to deteriorate locally. Dust and exhaust emissions from construction equipment may adversely affect residences adjacent to the culverts.

3.b., c., and e. The project will allow greater volumes of water to flow through the culverts than at present. This will prevent flooding of the area up to the one percent flood flow.

4. Short-term noise level increases will be generated during construction activities. Earth moving equipment, for example, typically results in average noise levels of 73 to 95 dBA at 50 feet. These high noise levels are likely to annoy nearby residents for intermittent periods.

5.a. The channel has been previously lined with concrete, eliminating riparian vegetation and wildlife in this reach.

8.a. Providing flood protection will not affect growth in the community to any extent since the flood hazard area is already fully developed except for a few small parcels.

11.c. and d. Temporary delays and possible detours to traffic will result during construction of the culverts. The presence of heavy construction equipment and attendant construction activities will create a slight hazard to motor vehicles, bicyclists, and pedestrians.

13.a.-e. Utilities, including water, sewer, gas, electric and telephone lines, may require modification or relocation prior to and during construction.

Mitigation Measures

1. Construction-related impacts will be mitigated to the extent possible by imposing strict conditions on the contractor performing the work with respect to adherence to local noise abatement standards, dust suppression, water quality standards, site maintenance and cleanup procedures, and public safety.

2. Traffic control during construction will be planned in cooperation with the City of Santa Clara and the County to minimize inconvenience to the public.

3. The City of Santa Clara will coordinate utility relocations to avoid or minimize any disruption of service to the public.

DETERMINATION

On the basis of this Initial Study:

☒ I find the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project.

☐ I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

Prepared by
Dr. Bernard H. Goldner

Environmental Specialist
Title

Date: ______________________